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Clouds and the Earth's Radian Energy System (CERES)

Data Management System Operator's Manual

**Subsystem Name
(Subsystem Number)**

CER Number

Release 2

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Preface

The Clouds and the Earth's Radiant Energy System (CERES) Data Management System supports the data processing needs of the CERES Science Team research to increase understanding of the Earth's climate and radiant environment. The CERES Data Management Team works with the CERES Science Team to develop the software necessary to support the science algorithms. This software, being developed to operate at the Langley Distributed Active Archive Center (DAAC), produces an extensive set of science data products.

The Data Management System consists of 12 subsystems; each subsystem represents one or more stand-alone executable programs. Each subsystem executes when all of its required input data sets are available and produces one or more archival science products.

This Operator's Manual is written for the data processing operations staff at the Langley DAAC by the Data Management Team responsible for this Subsystem. Each volume describes all Product Generation Executables for a particular subsystem and contains the Runtime Parameters, Production Request Parameters, the required inputs, the steps used to execute, and the expected outputs for each executable included within this Subsystem. In addition, all subsystem error messages and subsequent actions required by the DAAC operations staff are included.

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Introduction

The Clouds and the Earth's Radiant Energy System ([CERES](#)) is a key component of the Earth Observing System (EOS) program. The [CERES](#) instrument provides radiometric measurements of the Earth's atmosphere from three broadband channels: a shortwave channel (0.3 - 5 μm), a total channel (0.3 - 200 μm), and an infrared window channel (8 - 12 μm). The [CERES](#) instruments are improved models of the Earth Radiation Budget Experiment ([ERBE](#)) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as [ERBS](#), was successfully developed in [ERBE](#) to reduce time sampling errors. [CERES](#) continues that strategy by flying instruments on the polar orbiting [EOS](#) platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation and to improve the consistency between the cloud parameters and the radiation fields, [CERES](#) includes cloud imager data and other atmospheric parameters. The [TRMM](#) satellite carries one [CERES](#) instrument while the [EOS](#) satellites carry two [CERES](#) instruments, one operating in a fixed azimuth plane scanning mode (FAPS) for continuous Earth sampling and the other operating in a rotating azimuth plane scan mode (RAPS) for improved angular sampling.

Document Overview

blablabla

This document is organized as follows:

Introduction

[Document Overview](#)

[Document Overview](#)

[1.0 PGEName: PGEshortname](#)

[2.0 PGEName: PGEshortname](#)

[References](#)

[Appendix A](#) - Acronyms and Abbreviations

[Appendix B](#) - Error Messages for Subsystem_____

[Appendix C](#) - Sample ASCII (PCFin) File Listing(s) for Subsystem_____

Subsystem Overview

PGEshortname - PGElongname

blablablablabla

PGEshortname - PGElongname

blablablablabla

repeat for all PGEs

1.0 PGENAME: PGEshortname

PGElongname

1.1 PGE Details

1.1.1 Responsible Persons

Table 1-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name		
Organization	SAIC	SAIC
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone		
Fax		
LaRC email		

1.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in [Table 1-1](#).

1.1.3 Parent PGE(s)

Table 1-2. Parent PGEs for CER_____

PGENAME	Description

1.1.4 Target PGE(s)

Table 1-3. Target PGEs after CER_____ (Sheet 1 of 2)

PGENAME	Description

Table 1-3. Target PGEs after CER_____ (Sheet 2 of 2)

PGEName	Description

1.2 Operating Environment

1.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 1-4. Runtime Parameters for CER_____

Parameter	Description	Data Type	Valid Values

1.2.2 Environment Script Requirements

Refer to the CERES internal paper ([Reference 1](#)) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**bold_name**' and contains the following parameters:

blablabla
blablabla

1.2.3 Execution Frequency (daily, hourly,..)

blablabla

1.2.4 Memory/Disk Space/Time Requirements

Memory: ????
Disk Space: ????
Total Run Time: ????

1.2.5 Restrictions Imposed in Processing Order

blablabla

1.3 Processor Dependencies (Previous PGEs, Ingest Data,..)

Note: Include required .met files, header files, .. all required inputs

1.3.1 Input Dataset Name (#1): xxxx

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

BOLDdirectory

1. Mandatory/Optional: **This file is xxxx**
2. Time Related Dependency: **BoldAnswer**
3. Waiting Period: **BoldAnswer**

b. Source of Information (Source is PGE name or Ingest Source):

BoldAnswer

- c. Alternate Data Set, if one exists (maximum waiting period): **BoldAnswer**
- d. File Disposition after successful execution: **BoldAnswer**
- e. Typical file size (MB): **BoldAnswer**

1.3.2 Input Dataset Name (#2): yyyy

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

BOLDdirectory

1. Mandatory/Optional: **This file is xxxx**
2. Time Related Dependency: **BoldAnswer**
3. Waiting Period: **BoldAnswer**

b. Source of Information (Source PGE name or Ingest Source):

BoldAnswer

- c. Alternate Data Set, if one exists (maximum waiting period): **BoldAnswer**
- d. File Disposition after successful execution: **BoldAnswer**
- e. Typical file size (MB): **BoldAnswer**

1.3.3 Input Dataset Name(#3): Repeat a - e for all input datasets

1.4 Operating Procedures (Procedure for each part of the processor's elements)

blablabla
blablabla

1.4.1 How to Generate the ASCII File

blablabla

1.4.2 How to Generate the PCF File

blablabla

1.4.3 How to Execute the Main Processor

blablabla

1.4.4 Special Case Considerations

blablabla

1.4.5 Special Reprocessing Instructions

blablabla

1.5 Execution Evaluation

1.5.1 Exit Codes

blablabla

Table 1-5. Exit Codes for CER_____

Exit Code	Definition	Action

1.5.2 Screen Messages (Use Table format for large number of messages)

blablabla

1.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **bolddirectory**.

1. Report Log File: CER_____

The Report Log File contains xxxx

2. Status Log File: CER_____

The Status Log File contains xxxx

3. User Log File: CER_____

The User Log File ..

1.5.4 Solutions to Possible Problems

blablabla

1.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

- a. Subsystem Termination

blabla

- b. Target PGE Termination

blabla

1.6 Expected Output Dataset(s)

(Note: Include all expected Web files.)

blabla

Table 1-6. Expected Output File Listing for CER

File Name ^a /Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination ^b

- a. See [Section 1.2](#) for information on variable data values
If "(.met)" is written next to an expected Output Filename, then the metatdata file **must** exist with the identical filename and .met extension.
- b.
 - VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)
 - /QA - File is to be written to the DAAC designated /QA directory
 - DB - File content is to be entered into the LaTIS Database
 - rm - remove
 - YYYY - 4-digit year
 - MM - 2-digit month (valid values: 01 .. 12)
 - DD - 2-digit day (valid values: 01 .. 31)
 - HH - 2-digit hour of the day (valid values: 00 .. 23)
 - m - mandatory output
 - o - optional output
 - EOD - End of Data Month

1.7 Expected Temporary Files/Directories.

Table 1-7. Temporary Files Listing

Directory	File Name

2.0 PGEName: PGEshortname

PGElongname

Follow the Format of PGE1 for All Additional PGEs

References

1. Reference "Proposal for Semi-Automated Sampling Strategy, Production Strategy, and Configuration Code Implementation" internal paper for detail description of the CERES environment parameters. [URL: http://asd-www.larc.nasa.gov/ceres/intern_doc/](http://asd-www.larc.nasa.gov/ceres/intern_doc/)
- 2.
- 3.

APPENDIX A
Acronyms and Abbreviations

Appendix A

Acronyms and Abbreviations

CERES	Clouds and the Earth's Radiant Energy System
CM	Configuration Management
DAAC	Distributed Active Archive Center
DB	Data Base
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
HDF	Hierarchical Data Format
LaRC	Langley Research Center
LaTIS	Langley TRMM Information System
LW	Longwave
MB	Megabytes
met	metadata file
µm	microns
MOA	Meteorological, Ozone, and Aerosol
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File
PGE	Product Generation Executives
PSF	Point Spread Function
PRE_SSF	Preliminary Single Satellite CERES Footprint TOA and Surface Fluxes
QC	Quality Control
SAIC	Science Applications International Corporation
SMF	Status Message File
SSF	Single Satellite CERES Footprint TOA and Surface Fluxes, Clouds
SW	Shortwave
TOA	Top-of-Atmosphere
TRMM	Tropical Rainfall Measuring Mission
VD	Validation Days

APPENDIX B
Error Messages for Subsystem_____

Appendix B

Error Messages for Subsystem_____

Appendix B contains a comprehensive list of messages that can be generated during the execution of a PGE. These messages are used to inform the operator or analyst of specific circumstances encountered during data processing. These messages may be strictly informative (Error Type = Status or Warning), or may indicate a fatal condition that results in premature PGE termination (Error Type = Fatal). All messages are written to the LogReport file and/or the LogStatus File of the processing instance.

{Use this paragraph if you list error messages together for all of your PGEs.}

Table B-1 contains a list of the PGE CER_____ diagnostic messages { List all tables}. Each table entry includes a message number or pneumatic, {describe your table}.

{Use this paragraph if you list error messages separately for each PGE.}

Section B.1 contains a list of the diagnostic messages for PGE CER_____ and **Section B.2** contains a list of the diagnostic messages for PGE CER_____ {Include error message tables for each PGE in the appropriate section}. Each table entry includes a message number or pneumatic, {describe your table}.

Operator Instructions:

If a PGE prematurely terminates, then take the following steps:

1. Look at the last few records on the LogStatus file.
2. Find the error message in the following Error Message listing(s), and follow the appropriate ACTION
3. If an error message is not in the LogStatus File, then repeat steps 1 and 2 using the LogReport File.
4. If no information is derived, then call the responsible person in **Table 1-1**.
5. If the appropriate ACTION failed, then call the responsible person in **Table 1-1**.
6. In all cases, log all steps that were taken after the PGE failure, and send a copy to the responsible person listed in **Table 1-1**.

Document Instructions: The following Section is written as instructions to the Subsystem Leads and is not to appear in the Operator's Manual.

You may put all error messages for all PGEs in the same table if most of the error messages are the same for those PGEs, or you may specify them separately. If you specify the error messages separately for each PGE, then please use the subsection headings included at the end of these instructions (paragraph tag AppSecLvl1). Do not use the AppSecLvl1 tag if you have only 1 PGE or 1 set of error messages. Note the 2 choices of paragraph 2 above - pick the paragraph that describes how you have organized your error messages in this appendix. Delete the instructions

from the paragraph you pick, and delete the paragraph you do not use.

Please use one of the following table options in documenting your Error Messages. The Error Message Appendix should contain, at the very least, **all** of the Fatal and Error type messages that will prematurely terminate your PGE. It is very important that you document the correct ACTION that the operator must take.

Option 1. Create a table (see [Table B-1](#)) of error messages containing: the message content, the Error Type, and the recommended action that should be taken when the message is encountered. If your messages are numbered, then list the messages **in numeric order**. If your messages are not numbered, then list the messages **in alphabetic order**. The appropriate ACTION may be written out by each Message as shown in [Table B-1](#) or may appear as a list of action keys prior to the table, and the action keys may be placed in the Action Key column as shown in [Table B-2](#).

Table B-1. Example of User Defined Message Table

Message	Error Type	Action
100: ERROR opening PRE_SSF file	Fatal	Check PCF file for request name and location of SSFI file. Verify file exists in that location
102: ERROR in PRE_SSF header	Fatal	Verify MOA file is valid

Option 2. If you have used the Toolkit Error/Status Reporting Utility (SMF Tools), and created error message files (.t), then the Error Type is built into the error message. In this situation construct a table (see [Table B-2](#)) of the significant error messages, **in alphabetic order**, followed by the appropriate ACTION. The appropriate ACTION may be written out by each Message as shown in [Table B-1](#) or may appear as a list of action keys prior to the table, and the action keys may be placed in the Action Key column as shown in [Table B-2](#).

Action Keys for [Table B-2](#): (Note if an ACTION does not work, call the Responsible Person in [Table 1-1](#).)

1. Verify that file exists
2. Allocate more memory, rerun
3. No Action, call the Responsible Person in [Table 1-1](#).

Table B-2. Example of TK (SMF) Utility Message Table (Sheet 1 of 2)

Message/Error Type	Action Key
GGEFILE_E_FILECLOSERR	3
GGEFILE_E_FILEOPENERR	1
GGEFILE_E_HEDREADERR	3

Table B-2. Example of TK (SMF) Utility Message Table (Sheet 2 of 2)

Message/Error Type	Action Key
GGEFILE_E_MEMALLOC_ERR	Error...allocating memory for zone array

Option 3. If you wish to enhance the Error Message Table by adding a Module Source column by the Error Message (see [Table B-3](#) and [Table B-4](#)), that is your choice. Follow same instructions given in Option 1 or Option 2.

Table B-3. Example of User Defined Message Table

Message	Module Name	Error Type	Action

Table B-4. Example of TK (SMF) Utility Message Table

Message/Error Type	Module Name	Action Key

B.1 Error Messages for CER_____

List PGE 1-specific error message table(s)

B.2 Error Messages for CER_____

List PGE 2-specific error message table(s)

Etc. for additional sections for additional PGEs.

APPENDIX C
Sample ASCII (PCFin) File Listing(s) for Subsystem_____

Appendix C
Sample ASCII (PCFin) File Listing(s) for Subsystem_____

C.1 Sample ASCII (PCFin) File Listing for CER_____

Name of the sample PCFin 1 for CER_____ followed by the sample listing.

C.2 Sample ASCII (PCFin) File Listing for CER_____

Name of the sample PCFin 2 for CER_____ followed by the sample listing.

C.3 etc.